

WHAT IS CLAIMED IS:

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1. An exposure apparatus comprising:
a projection optical system which projects a pattern of a first object to a second object by using an exposure beam in order to transfer the pattern from the first object onto the second object;
a diaphragm which sets a numerical aperture of said projection optical system; and
a mechanism which keeps temperature of said diaphragm substantially constant during an exposure operation by said projection optical system.
 2. An apparatus according to Claim 1, wherein said mechanism comprises a fluid circulation system, which is provided with said diaphragm, in which a temperature controlled fluid circulates.
 3. An apparatus according to Claim 2, wherein said mechanism controls the temperature of said diaphragm to be almost the same as that of said projection optical system, during the exposure operation.
 4. An apparatus according to Claim 3, further comprising a constant temperature system for said projection

5. An apparatus according to Claim 1, wherein said mechanism comprises a Peltier element.

7. An apparatus according to Claim 6, wherein said sensor is located at a position not being irradiated with the exposure beam.

8. An apparatus according to Claim 7, wherein said sensor is provided on said diaphragm, on a side facing the second object.

9. An apparatus according to Claim 1, wherein said diaphragm comprises an iris diaphragm.

10. An apparatus according to Claim 1, wherein said diaphragm comprises a turret having a plurality of openings.

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a 11 } 12. A micro-device manufacturing method comprising:
projecting, through a projection optical system, a
pattern of a reticle to a wafer by using an exposure beam,
in order to transfer the pattern from the reticle onto the
wafer;

keeping temperature of the diaphragm substantially constant during an exposure operation by the projection optical system; and

13. A method according to Claim 12, wherein said keeping step comprises keeping the temperature of the diaphragm by circulating a fluid proximate to the diaphragm.

14. A method according to Claim 13, wherein the temperature of the diaphragm is kept to be almost the same as that of the projection optical system, during the

re operation.

15. A method according to Claim 14, comprising controlling temperature of the p as well as that of the diaphragm.

16. A method according to Claim 12, comprising step comprises keeping the temperature of the diaphragm using a Peltier element.

17. A method according to Claim 12, comprising detecting temperature information of the diaphragm with a sensor, and controlling the diaphragm based on an output of the sensor.

18. A method according to Claim 17, comprising providing the sensor at a location associated with the exposure beam.

19. A method according to Claim 18, comprising providing the sensor on the diaphragm of the second object.

20. A method according to Claim 12, wherein the diaphragm comprises an iris diaphragm.

15. A method according to Claim 14, further
 16. comprising controlling temperature of the projection optical
 17. system as well as that of the diaphragm.

16. A method according to Claim 12, wherein said
 17. step comprises keeping the temperature of the
 18. using a Peltier element.

17. A method according to Claim 12, further
 18. comprising detecting temperature information of the
 19. diaphragm with a sensor, and controlling the temperature of
 20. the diaphragm based on an output of the sensor.

18. A method according to Claim 17, further
 19. providing the sensor at a location not being
 20. related with the exposure beam.

19. A method according to Claim 18, further
 20. providing the sensor on the diaphragm on a side
 21. of the second object.

20. A method according to Claim 12, wherein the
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A method according to Claim 12, comprising a turret having a plurality of nozzles.

A method according to Claim 12, comprising a resist processing step comprising a resist process.

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